The opinion in support of the decision being entered today
was not written for publication and is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EUGENE ESTINTO

Appeal No. 2000-1461
Application No. 08/716,905

ON BRIEF

Before HAIRSTON, KRASS, and BARRETT, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-7, all of the pending claims.

The invention is directed to a method and apparatus for determining performance characteristics of satellite transponders. More particularly, the measurements of the

present invention are made using a wideband modulated data signal rather than a swept tone, as done conventionally.

Representative independent claim 1 is reproduced as follows:

> 1. A method of measuring distortion in satellite RF transponders operated at or near saturation comprising,
>
> transmitting a periodic RF signal having a known periodic pattern to said transponders on said satellite, said wideband RF signal[1] being generated by modulating the output of a PN sequence generator,
>
> receiving wideband RF signals at said transponder which retransmits the wideband RF signals,
>
> downconverting said relayed said relayed [sic] wideband RF signals to baseband inphase (I) and quadrature phase (Q) signal components,
>
> converting said I and Q signal components to I and Q digital signal components and storing said I and Q digital signal component in computer memory, and
>
> performing one or more of the following measurements on the stored I and Q digital signal components:
>
> - Magnitude and phase response
> - AM/AM and AM/PM
> - Phase noise
> - Bit error rate
> - Data asymmetry
> - I/Q channel imbalance.

[1] "said wide band RF signal" appears to lack proper antecedent basis.

The examiner relies on the following references:

Thomas	4,038,600	Jul. 26, 1977
Tarantino et al. (Tarantino)	5,099,200	Mar. 24, 1992
Kroeger et al. (Kroeger)	5,404,375	Apr. 04, 1995

Claims 1-7 stand rejected under 35 U.S.C. § 103 as unpatentable over Thomas in view of Tarantino and Kroeger.

Reference is made to the briefs and answer for the respective positions of appellant and the examiner.

OPINION

At the outset, we note that claims 1-7 will stand or fall together, in accordance with appellant's grouping of the claims, at page 5 of the principal brief.

It is the examiner's position that Thomas discloses power control on a satellite uplink and also discloses a method of measuring distortion in satellite RF transponders. The examiner recognizes a failure in Thomas regarding the teaching of a PN sequence generator, a downconverting of the relayed periodic RF signals to baseband in phase (I) and quadrature phase (Q) signal components, converting those signal components to

digital signal components and storing I and Q digital signal components in computer memory and performing one or more of the claimed measurements.

The examiner turns to Tarantino for the disclosure of a calibration system which discloses the claimed measurements on the magnitude and phase response and storing in a memory, pointing to column 2, lines 59-65. Thus, the examiner holds it to have been obvious to modify Thomas by specifically providing a distortion analyzer which measures magnitude and phase responses, as disclosed by Tarantino, for the purpose of quickly and accurately quantifying the frequency response of an instrument across its entire passband without the use of additional equipment.

Finally, the examiner turns to Kroeger for a disclosure of "downconverting (40) said relayed periodic RF signals to baseband in phase (I) and quadrature phase (Q) signal components, converting (42) said I and Q signal components to I and Q digital signal components and storing said I and Q digital signal components in a computer (44,64)" [answer-page 4], pointing to column 7, lines 30-40. The examiner further identifies column 8, lines 5-12, of Kroeger for a teaching of transmitting and receiving a wide- band RF.

The examiner concludes that it would have been obvious to modify the modified Thomas reference by specifically providing a downconverting of the relayed RF periodic signals to baseband inphase (I) and quadrature phase (Q) signal components, converting those components to I and Q digital signal components and storing the I and Q digital signal components in a computer and a wideband signal, as disclosed by Kroeger for the purpose of providing an inexpensive transceiver, for transmitting and receiving data through a satellite communication network.

For his part, appellant contends that the essence of the invention is the use of a "wideband" signal, in the form of an actual modulated data signal, in contrast to a "narrowband" signal which is swept across the band to make the measurement. Appellant contends that Thomas does not involve measuring a frequency response of a satellite transponder and does not involve using a wideband modulated signal in measuring the input signal power level to the transponder in Thomas. In fact, states appellant, Thomas is "not particularly relevant to the present invention" [principal brief-page 6] because it simply provides means for determining the input power level to a transponder.

While Tarantino does disclose measurement of the frequency response of a transponder, appellant points out that this reference makes a measurement using a

narrowband swept tone and requires many individual measurements to obtain the final result sought by Tarantino [principal brief-page 6].

Finally, appellant contends that Kroeger does not involve any measurements of system distortion but only transmits and receives data through a satellite communications network, with no suggestion of "anything approaching the measuring of distortion in RF transponders, let alone in the field set out in applicant's claims" [principal brief-page 9].

We will reverse as we do not find that the examiner has made out a sufficient case of obviousness of the instant claimed subject matter.

We do agree with the examiner that appellant's arguments that neither Thomas nor Tarantino discloses a wideband modulated signal are unpersuasive because the rejection relied on Kroeger for a teaching of transmitting and receiving wideband signals.

However, as pointed out by appellant [reply brief-page 2], Kroeger may disclose a wideband communication system but "it is simply a system for transmitting and receiving outbound and inbound data signals through a satellite communications network. It does not in any way speak in terms of measurements and characterization of the signal measurements. It does not speak in terms of 'measuring distortion in satellite RF transponders operated at or near saturation...' as is recited in appellant's claims 1 and 2. Thus, it is not in the same field of endeavor."

The examiner has taken teachings from three disparate references and attempts to combine them to arrive at the instant claimed subject matter with apparently no suggestion from the references for doing so.

Each of the instant claims requires the measurement of distortion in an RF network or the performance characterization of Ka band transponders. Thomas is concerned with controlling the output power of a transmitter communicating with a remotely positioned receiving station through a linear transponder located at a satellite in order to keep the power level of the input signal substantially constant. Tarantino is concerned with determining the phase and amplitude response of a superheterodyne instrument wherein data is acquired as a signal sweeps the passband and is analyzed to determine the phase and amplitude characteristics of the instrument. Finally, Kroeger is concerned with satellite communication but not with measurement of signal distortion in RF transponders.

Accordingly, it is difficult to understand why the skilled artisan would have been led to combine the teachings of these references in some manner to arrive at the instant claimed invention. More specifically, the claims call for, at least, the measuring of distortion (or performance characterization) in satellite RF transponders wherein a periodic wideband RF signal having a known periodic pattern is transmitted to a transponder

on a satellite wherein the wideband RF signal is generated by modulating the output of a PN sequence generator. There is no suggestion in any of the applied references for employing any wideband teaching that Kroeger may have to Thomas and/or Tarantino which are not concerned with wideband RF signals. Moreover, while Thomas discloses a distortion analyzer 24, that analyzer measures power level of the third order intermodulation product to determine the power level of the input signal to the transponder 20 [see column 4, lines 22-42, of Thomas] and there is no suggestion in Thomas that distortion in satellite RF transponders, in the manner claimed, is contemplated by Thomas, or any of the other applied references.

The "wideband RF signal" is part of each of the instant claims and it is important that such wideband periodic RF signal is transmitted to the transponders on the satellite, received at the transponder which then retransmits the wideband RF signals and said relayed wideband RF signals are then downconverted as claimed. There is absolutely no disclosure or suggestion of these interrelated elements and/or steps in the combination of applied references and the examiner has not convinced us otherwise.

The examiner's decision rejecting claims 1-7 under 35 U.S.C. § 103 is reversed.

REVERSED

KENNETH W. HAIRSTON Administrative Patent Judge	)
ERROL A. KRASS Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
LEE E. BARRETT Administrative Patent Judge	)

eak/vsh

JIM ZEGEER
SUITE 108
801 NORTH PITT STREET
ALEXANDRIA, VA 22314